

Drawing Objections 37 C.F.R. §1.83 (a)

The Examiner has objected to the drawings under 37 C.F.R. §1.83 (a). In the Examiner's opinion, the drawings do not show every feature of the invention specified in the claims. However, the Examiner has not clearly indicated the claim numbers that correspond to the claims that specify the features that the Examiner believes are not shown in the drawings.

Nevertheless, Applicant believes that the Examiner is referring to claim 68 (referring to "a wafer"), claim 73 (referring to "a device for determining profile or topography of said wafer"), claim 74 (referring to "a device for determining high points and low points on surface of said wafer in said center area and said edge area"), and claim 75 (referring to "slurry disposed in said first set of grooves and said second set of grooves").

Applicant has canceled claims 68-75 without prejudice.

Claim Rejections 35 U.S.C. § 102 (e)

The Examiner has rejected claims 54-72 and 75 under 35 U.S.C. §102 (b) as being anticipated by Burke et al. In the Examiner's opinion, Burke et al. teaches a polishing pad 130, having a center area (fig. 8), and an edge area, with a first set of grooves located in the center area with a first depth, first width, and first density, a second set of grooves located in the edge area with a second set of grooves having a second depth, second width, and a second density. In the Examiner's opinion, Burke et al. also teaches that the first depth, width, and density is smaller than the second depth, width, and density, and that the first set of grooves and the second set of grooves differ in shape.

The Examiner has not identified the patent being referred to in the Office Action mailed on August 28, 2001. Previously, Applicant had cited Cathie J. Burke et al. (US 5,665,249) on November 8, 1999 and the Examiner had cited Peter A. Burke et al. (US 5,645,469) on September 19, 2000. Each patent includes a Figure 8. Each Figure 8 shows a polishing pad.

However, Applicant believes that the examiner is referring to Burke et al. (US 5,645,469) so Applicant will address this particular patent in this response.

Applicant respectfully disagrees with the Examiner. According to Applicant's claimed invention, a polish pad having differences in grooves between the "pad center area" and the "pad edge area" allows compensation for polish rate non-uniformity between the "wafer center area" (120) and the "wafer edge area" (110). See lines 19-22 on page 10 of the specification. Also see Figure 1. See Lines 5-9 on page 11 of the specification. Also see Figure 2. In other words, Applicant contemplates the modification of depth, width, shape, and density of "circumferential" grooves in a polish pad in order to compensate for polishing differences between the center and the edge of a wafer and, thus, achieve an ideal wafer profile.

Applicant has amended claims 54, 59, and 64 to indicate such a correspondence between the polish pad areas with the wafer areas. Claims 55-58 depend on claim 54. Claims 60-63 depend on claim 59. Claims 65-67 depend on claim 64.

In contrast, Burke et al. fails to teach any correspondence between the center/edge of the pad and the center/edge of the wafer. Instead, Burke et al. adds various "sunburst" designs of "tangential" grooves (20) to a polish pad (10) without modifying the "circumferential" grooves (26). See col. 4, lines 42-60. Also see Figure 1. Another design is shown in Figure 3.

Since this reference cited by the Examiner does not teach each and every element of Applicant's claimed invention, claims 54-67 of Applicant's claimed invention are not anticipated by Burke et al.

In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 54-67 under 35 U.S.C. §102 (b).

Applicant has canceled claims 68-72 and 75 without prejudice.

Claim Rejections 35 U.S.C. § 103 (a)

The Examiner has rejected claims 73 and 74 under 35 U.S.C. §103 (a) as being unpatentable over Burke et al. in view of Sandhu et al. Applicant would like to bring to the attention of the Examiner that these two patents have not been clearly identified by the Examiner.

First, regarding Burke et al., Applicant had previously cited Cathie J. Burke et al. (US 5,665,249) on November 8, 1999 and the Examiner had cited Peter A. Burke et al. (US 5,645,469) on September 19, 2000. Applicant is unable to determine whether the Examiner is referring to one of these patents or to some other patent.

Second, after reviewing Applicant's copy of the prosecution file, Applicant is unable to find any citation of a patent by Sandhu et al. on either a form PTO-1449A or a form PTO-892. A very large number of patents has issued to Sandhu et al. relating to chemical-mechanical polishing. Thus, Applicant is unable to ascertain which patent is being referred to by the Examiner.

Applicant respectfully requests the Examiner to unambiguously identify the Burke et al. reference and the Sandhu et al. reference in order to permit Applicant to review and consider both patents cited by the Examiner.

Applicant has canceled claims 73 and 74 without prejudice.

CONCLUSION

Applicant believes that all claims pending, including amended claims 54, 59, and 64, are now in condition for allowance so such action is earnestly solicited at the earliest possible date.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

54. (Once Amended) A polish pad comprising:

a pad center area, said pad center area corresponding to a wafer center area;

a first set of grooves disposed in said pad center area, said first set of grooves having a first depth;

[an] a pad edge area disposed adjacent to said pad center area, said pad edge area corresponding to a wafer edge area; and

a second set of grooves disposed in said pad edge area, said second set of grooves having a second depth.

59. (Once Amended) A polish pad comprising:

a pad center area, said pad center area corresponding to a wafer center area;

a first set of grooves disposed in said pad center area, said first set of grooves having a first width;

[an] a pad edge area disposed adjacent to said pad center area, said pad edge area corresponding to a wafer edge area; and

a second set of grooves disposed in said pad edge area, said second set of grooves having a second width.

64. (Once Amended) A polish pad comprising:

a pad center area, said pad center area corresponding to a wafer center area;

a first set of grooves disposed in said pad center area, said first set of grooves having a first density;

[an] a pad edge area disposed adjacent to said pad center area, said pad edge area corresponding to a wafer edge area; and

a second set of grooves disposed in said pad edge area, said second set of grooves having a second density.